

CLINICAL ETHICS

"Do-not-resuscitate" orders in patients with cancer at a children's hospital in Taiwan

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Objectives: To quantify the use of do-not-resuscitate (DNR) orders in a tertiary-care children's hospital and to characterise the circumstances in which such orders are written.

Design: Retrospective study conducted in a 500-bed children's hospital in Taiwan.

Patients: The course of 101 patients who died between January 2002 and December 2005 was reviewed. The following data were collected: age at death, gender, disease and its status, place of death and survival. There were 59 males and 42 females with a median age of 103 months (range 1–263 months). 50 children had leukaemias, and 51 had malignancies other than leukaemia. The t test and the χ^2 test were applied as appropriate.

Results: The study found that 44% of patient deaths occurred in the paediatric oncology ward; 29% of patient deaths occurred in the intensive care unit; and 28% of patients died in their home or at another hospital. Other findings included the following: 46 of 101 (46%) patients died after attempted cardiopulmonary resuscitation and 55 (54%) died with a DNR order in effect. The mean age at death was 9.8 years in both groups with or without DNR orders.

Conclusions: From the study of patient deaths in this tertiary-care children's hospital, it was concluded that an explicit DNR order is now the rule rather than the exception, with more DNR orders being written for patients who have been ill longer, who have solid tumours, who are not in remission and who are in the ward.

The well-being and best interests of the patient should always be promoted and safeguarded. Ideally, cardiopulmonary resuscitation (CPR) should only be attempted in patients for whom there is a good chance of a successful revival and not when it merely prolongs the process of dying. The "do-not-resuscitate" (DNR) order helps eliminate the inappropriate and futile use of CPR, but it has wide-ranging ethical, legal and economic implications.^{1,2} The aim of this study was to explore the experiences of families of children with terminal cancer who elected to have the DNR order to better understand the circumstances that lead to this difficult and complex decision.

MATERIAL AND METHODS

Patients

A retrospective evaluation was performed using the medical charts of all paediatric patients with cancer treated at the oncological ward of Chang Gung Children's Hospital who had various malignancies, and consequently died from their diseases during the period from January 2003 to December 2005. There are approximately 10 900 admissions per year in the 30-bed multidisciplinary unit of this ward. In all, 101 patients were found to fit the criteria for this study. There were 59 boys and 42 girls, aged from 1 to 263 months (median 103 months). The children suffered from the following cancers: 50 leukaemias, 15 sarcomas, 11 brain tumours, 7 neuroblastomas, 4 lymphomas and 14 other varieties of cancers. Clinical characteristics, date of birth, sex, underlying disease and survival data were obtained from a review of patient charts.

The pre-intensive care unit (ICU) attending physician generally participates actively in clinical decision-making. If the attending physician determines that CPR would be medically futile for that person, and the second physician concurs in the judgement, then the attending physician should obtain the informed consent of the surrogate before the entry of

a DNR order in the patient's medical record. However, DNR orders do not exclude interventions such as parenteral fluids, nutrition, oxygen, sedation, analgesia, vasopressors and anti-arrhythmic drugs.

Data analysis

The primary approach to analysing the data was a time-to-event analysis, for which the event was the date of death. For descriptive purposes only, the study also defined two treatment groups—including either patients with leukaemia or patients with malignancies other than leukaemia. The statistical significance of differences for variables such as age at death, gender, disease and its status, place of death, parents' current marital status and survival pertaining to DNR orders was assessed by the χ^2 test with a significance of 5%.

RESULTS

Table 1 lists the baseline characteristics of patients. DNR orders were registered in the medical charts of 55 children who died of cancer during the period under consideration. As all citizens of Taiwan have national health insurance coverage, treatment was never withdrawn from patients for economic reasons.

Place of death

Concerning place of death, 44 (43.6%) patients died in the paediatric oncology ward; 39 had DNR orders with informed consent in their medical charts; 29 (28.7%) patients died in the ICU; 6 had written DNR consent; 28 (27.7%) patients died at home or other hospitals; and 10 patients were discharged from the hospital with written consent for DNR orders.

Abbreviations: CPR, cardiopulmonary resuscitation; DNR, do-not-resuscitate; ICU, intensive care unit

Table 1 Relationship between primary diagnosis and resuscitation status

Diagnosis	Resuscitation status			Total
	CPR	Brain death	DNR	
Leukaemia	18	0	32	50
Sarcoma	2	1	12	15
Brain tumour	2	2	7	11
Neuroblastoma	1	0	6	7
Lymphoma	3	0	1	4
Other	9	1	4	14
Total	35	4	62	101

CPR, cardiopulmonary resuscitation; DNR, do-not-resuscitate.

Of the 101 patients in the study, 35 (34%) patients died after attempted CPR, and most patients who died >1 day after a CPR attempt did have a DNR consent executed before death. The timing of the DNR order after CPR attempted or no-CPR was attributed to physician treatment decisions rather than to patient presentation. Parents or surrogates consent to a DNR order on an incapacitated patient after a CPR attempt in 41 patients. The time elapsed was >3 days between the entering of a DNR in the medical record and death in 37 patients. Most patient consents were obtained in the ward. No patient with a DNR order in place received subsequent CPR.

The ages at death for both groups with or without a DNR order were statistically identical (mean age 9.8 years). Older patients were less likely to have DNR orders in effect at the time of death than younger patients. Among the patients who died with written DNR consent, the mean duration of life from the diagnosis of disease was 25.1 months, whereas in the group of patients without such orders the mean duration was 16.2 months ($p<0.05$). There was a significant association between DNR orders and patients who had malignancies other

than leukaemia ($p<0.001$), underlying disease in relapse ($p<0.005$) and death occurring in the ward ($p<0.001$; table 2).

All patients were in the terminal stage of their diseases with a poor performance status. The immediate cause of death could be attributed directly to progressive cancer in 94% of patients, with six patients dying from sepsis. Those with a DNR were more likely to remain in the ward and less likely to die in an ICU or while connected to a ventilator.

There was a family meeting session for potentially futile medical interventions. In this session, DNR status was discussed with the rationale that CPR would be futile for patients with progressive cancer. DNR orders, documented in about 55% of the study's cases, were written after obtaining consent, not by patients themselves but by family or surrogates.

DISCUSSION

Many physicians think that informed consent (to obtain the patient's signature on a form) is merely a formality that is necessary in order to allow a specific procedure or treatment to be performed on the patient. For children, the treating physician's judgement served as the basis for DNR orders when they believed an attempt to resuscitate the child was futile, and the parent or surrogate decision-maker expressed his or her preference that CPR be withheld in the event that the child experienced a cardiopulmonary arrest.³ Physician decisions about CPR may be heavily influenced by factors such as their own values and preferences.⁴ In practice, DNR discussions are often difficult for physicians and patients alike, resulting in DNR orders being written shortly before death.⁵ Whenever possible, the decision about a DNR order should be a group decision that takes into account the views of hospital staff and, where appropriate, the beliefs of the patient and relatives.⁶

DNR orders facilitate the avoidance of futile and unnecessary medical interventions up to time of death.³⁻⁷ Understanding the benefits of a DNR order does not, however, make the decision

Table 2 Demography and medical diagnosis of the patients

	DNR order		p Value
	With (n = 55)	Without (n = 46)	
Death age (years), mean (SD)	116.67 (65.15)	113.03 (72.69)	0.791
Survival time (years), mean (SD)	25.09 (15.38)	16.19 (15.81)	0.005
Gender, n (%)			0.509
Male	30 (54.55)	29 (64.04)	
Female	25 (45.55)	17 (36.96)	
Underlying disease, n (%)			<0.001
Leukaemia	18 (32.73)	32 (69.57)	
Solid tumour	37 (67.27)	14 (30.43)	
Remission status, n (%)			0.001
Yes	0 (0.0)	8 (17.39)	
No	55 (100.0)	38 (82.61)	
Parents' marital relationship, n (%)			1.000
Accord	50 (90.91)	42 (91.30)	
Discord or divorce	5 (9.09)	4 (8.70)	
Age group (years), n (%)			0.444
<2	3 (5.45)	8 (17.39)	
2-10	28 (50.91)	17 (36.96)	
>10	24 (43.64)	21 (45.65)	
The place of death, n (%)			<0.001
Wards	39 (70.91)	5 (10.87)	
ICU	6 (10.91)	23 (50.00)	
Home or other hospital	10 (18.18)	18 (39.13)	

DNR, do-not-resuscitate; ICU, intensive care unit.

to give consent easier for terminally ill or severely disabled children and their parents.

Some points deserve further discussion. The percentage of DNR patients in the study was similar to those mentioned in the literature.⁸⁻¹¹ First, the patients in the paediatric department may have been more severely affected or had worse prognoses than some patients in the ICU. Second, the attitudes towards life and death may be different for cultural as well as judicial and insurance reasons. Furthermore, no patient personally signed his or her own DNR consent. They should not be presumed to be unable to make treatment decisions. Obviously, it is difficult for young patients to participate in a decision about DNR orders. Because several teenagers rely on their parents too much, the Taiwanese patient may often be overprotected and precluded from knowing the reality of his or her terminal disease. The reasons for not discussing decisions have little to do with ageism and more to do with practicalities.

The data should be interpreted in the light of several limitations inherent in the study design. First, our study was performed in a single hospital, and the results may not be generalisable to other hospitals. Second, the study was retrospective in design, so that prospective study by validation cohort seems mandatory in order to verify the results.

CONCLUSION

Remission status seems to affect physician attitudes about discussing resuscitation or DNR orders. Consensus with families about forgoing limitation or withdrawal of life-sustaining treatment can be reached in almost half of the patients at the end of life.

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